SOLID-STATE LIGHTING:

Solid-State Lighting Patents Resulting from DOE-Funded Projects

Notable progress toward solid-state lighting (SSL) technology commercialization is evident in patent applications and awards.

As of January 2011, 34 SSL patents have been awarded to research projects funded by the U.S. Department of Energy (DOE). Since December 2000, when DOE began funding SSL research projects, a total of 113 patent applications have been submitted, ranging from large businesses (43) and small businesses (34) to universities (32) and national laboratories (4).

Primary Research Organization	Titles of Patent Applications (Bold indicates patents that were granted)
Agiltron, Inc.	Two patent applications filed
Boston University	**Optical Devices Featuring Textured Semiconductor Layers** Formation of Textured III-Nitride Templates for the Fabrication of Efficient Optical Devices Formation of Textured III-Nitride Templates for the Fabrication of Efficient Optical Devices Nitride LEDs Based on Flat and Wrinkled Quantum Wells
Cree, Inc.	**Light Emitting Diode with Porous SiC Substrate and Method for Fabricating** **Light Emitting Diode Package Element with Internal Meniscus for Bubble Free Lens Placement** Light Emitting Diode with High Aspect Ratio Sub-Micron Roughness for Light Extraction and Methods of Forming Light Emitting Diode with High Aspect Ratio Sub-Micron Roughness for Light Extraction and Methods of Forming One other patent application filed
Dow Corning	Four patent applications filed
Eastman Kodak	**Ex-Situ Doped Semiconductor Transport Layer** **Doped Nanoparticle-Based Semiconductor Junction** **Device Containing Non-Blinking Quantum Dots** Two other patent applications filed
Fairfield Crystal Technology	Method and Apparatus for Aluminum Nitride Monocrystal Boule Growth
GE Global Research	**Light-Emitting Device with Organic Electroluminescent Material and Photoluminescent Materials** **Luminaire for Light Extraction from a Flat Light Source** **Mechanically Flexible Organic Electroluminescent Device with Directional Light Emission** **Organic Electroluminescent Devices and Method for Improving Energy Efficiency and Optical Stability Thereof** **Series Connected OLED Structure and Fabrication Method** **Organic Electroluminescent Devices Having Improved Light Extraction** **Electrodes Mitigating Effects of Defects in Organic Electronic Devices** **OLED Area Illumination Source** Hybrid Electroluminescent Devices Eleven other patent applications filed
Georgia Tech Research Corporation	One patent application filed
International Technology Exchange	One patent application filed

Primary Research Organization	Titles of Patent Applications (Bold indicates patents that were granted)
Light Prescriptions Innovators	**Optical Manifold for Light-Emitting Diodes** **Optical Manifold for Light-Emitting Diodes** **Optical Manifold** Optical Device for LED-Based Lamp Four other patent applications filed
Maxdem Incorporated	Polymer Matrix Electroluminescent Materials and Devices
Nanosys	**Nanocrystal Doped Matrices**
OSRAM Opto Semiconductors, Inc.	**Integrated Fuses for OLED Lighting Device** **Novel Method to Generate High Efficient Devices, Which Emit High Quality Light for Illumination** **Polymer and Small Molecule Based Hybrid Light Source** Novel Method to Generate High Efficient Devices, Which Emit High Quality Light for Illumination OLED with Phosphors Polymer Small Molecule Based Hybrid Light Source Two other patent applications filed
Pacific Northwest National Laboratory	Organic Materials with Phosphine Sulphide Moieties Having Tunable Electric and Electroluminescent Properties Organic Materials with Tunable Electric and Electroluminescent Properties
Philips Electronics North America	High Color-Rendering-Index LED Lighting Source Using LEDs from Multiple Wavelength Bins Three other patent applications filed
Philips Lumileds Lighting	Two patent applications filed
PhosphorTech Corporation	**Light Emitting Device Having Selenium-Based Fluorescent Phosphor** **Light Emitting Device Having Silicate Fluorescent Phosphor** **Light Emitting Device Having Sulfoselenide Fluorescent Phosphor** **Light Emitting Device Having Thio-Selenide Fluorescent Phosphor**
Purdue University	Metallized Silicon Substrate for Indium Gallium Nitride Light-Emitting Diode One other patent application filed
RTI	Six patent applications filed
Sandia National Laboratory	**Cantilever Epitaxial Process** **Nanowire-Templated Lateral Epitaxial Growth of Non-Polar Group III Nitrides**
Universal Display Corporation	**Binuclear Compounds** **Organic Light Emitting Device Structure for Obtaining Chromaticity Stability** **Organic Light Emitting Device Structure for Obtaining Chromaticity Stability** Stacked OLEDs with a Reflective Conductive Layer One other patent application filed
University of California, San Diego	Rare-Earth Activated Nitrides for Solid State Lighting Applications Two additional patent applications filed
University of California, Santa Barbara	**Plasmon Assisted Enhancement of Organic Optoelectronic Devices** Silicone Resin Encapsulants for Light Emitting Diodes Enhancing Performance Characteristics of Organic Semiconducting Films by Improved Solution Processing Six other patent applications filed
University of North Texas	Three patent applications filed
University of Southern California	**Fluorescent Filtered Electrophosphorescence** **Fluorescent Filtered Electrophosphorescence** **OLEDs Utilizing Macrocyclic Ligand Systems** Materials and Architectures for Efficient Harvesting of Singlet and Triplet Excitons for White Light Emitting OLEDs Organic Vapor Jet Deposition Using an Exhaust Phenyl and Fluorenyl Substituted Phenyl-Pyrazole Complexes of Ir Low Index Grids (LIG) to Increase Outcoupled Light from Top or Transparent OLED Three additional patent applications filed

For More Information

For more information on the DOE SSL Project Portfolio, see www.ssl.energy.gov/projects.html.

EERE Information Center

1-877-EERE-INFO (1-877-337-3463)

www.eere.energy.gov/informationcenter

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